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THE GULF OF MEXICO:

CIAL REFERENCE TO ITS NORTHWEST ANGLE, THE MONSOON, AND THE GULF STREAM.

By the term "Monsoon" is meant any local deflection of a part of the general current of the trade wind. A remarkable instance occurs in the Gulf of Mexico and the adjacent territory, first noticed, as is believed, by Lieut. MAURY in his Physical Geography of the Sea. From Yucatan northward, towards the great plains along the eastern base of the Rocky Mountains, during eight or nine months of the year, there usually prevails a strong wind, bounded, in a general way, by a line running N.N.W. from the mouth of the Sabine river on the east, and by a tangent to the Gulf of Mexico, at its extreme western portion near Tampico. These limits are not well defined, and are varied by frequent meteorological perturbations; but, for general purposes this designation will suffice.

The causes and effects of this monsoon are of much interest to practical producers of Southern staples, and to commercial men, as well as to naturalists. The speculations, which follow, may not be correct, but may serve to direct attention of more competent persons and to elicit the results of more careful observations. With this view these remarks are submitted.

As the earth turns its northerly half gradually to the sun in advancing spring the land becomes, also, gradually heated by absorption of the sun's rays, whilst the sea remains at nearly uniform temperature. The great sandy plains along the Rocky Mountains become intensely heated, and impart their temperature to the incumbent air, which, being rarified, ascends and leaves a void to be filled by the adjacent colder air found on the Gulf of Mexico, whence, rushing into the vacuum, it produces the strong wind from the S.S.E. so well known on the coast of Texas

But why is this supply of cold air thus found on the Gulf of Mexico? The answer to this involves disputed theories, which may not be correct, but the facts are admitted. In the Caribbean Sea, at a depth of two hundred fathoms, a temperature is found but little above the freezing point. This remarkable fact is ascribed by Lieut. Maury to a current, from the Arctic sea, setting along the coast of North America, down to the banks of Newfoundland, where it divides and sends the larger part *under* the Gulf Stream, and through unfathomed depths into the tropics, to cool the waters there, and thus restore the thermal equilibrium. That motion of the waters, long known as the "Gulf Stream," from its most southern locality, carries along the hot superficial stratum and the cold mass below, which in moving commingle gradually until they reach the narrow passage between Yucatan and Cuba, where they become thoroughly stirred up by the convolutions of currents and counter currents, produced by the rocks and headlands, as may be witnessed on a smaller scale at Hell-gate, in Long Island Sound. This stirring of the waters sometimes produces a roaring noise, like that of an approaching storm, as reported to the writer by an intelligent young naval officer, the late master of the U. S. sloop Saratoga. The hot and the cold waters, being thus mixed, present a temperature compounded of the two, but far below that of the surface water in the contiguous bays. The moving volume, having passed the strait, parts into two currents, one hugging around Cuba on the right, the other turning to the left.—The latter, running north-west, gives to Padre Island a bold shore, thence turns eastward, passes near the Balize, and joins the Cuban branch off Florida Point. This stream then passes northward through the straits and keys along Florida and the Bahamas, changing its relative temperature so as to give the warm breezes, that nourish the Sea Island cotton along the Southern Atlantic coast, and also the genial refuge of ships when driven from the stormy North. For instance, off Cape Hatteras the temperature of this wondrous "river in the sea" is far higher than at its exit from the caldron off Cape San Antonio. Thus this body of warm water is projected along our Atlantic coast, where it is so much needed, evincing another of the beautiful compensations of Providence.

But, let us return to the Gulf. The precise course of this stream from Cape Catoche towards the Texan coast is not known, but the extensive flats called "Campeachy Banks," show that it does not pass near that coast, and it probably deviates but little from a line tending to the mouth of the Rio Grande, thus leaving the deep bay towards Vera Cruz and Tehuantepec, like that of Honduras and the Mosquito Gulf, a stagnant sea, disturbed only by occasional currents, produced by varying winds. But, this current of water, relatively cold in that locality, is well known to sweep near to the coast north of Brazos de Santiago, giving to Padre Island its remarkably even outline and deep soundings near shore, turning to the east where the coast, also, turns from north to north-east, and penetrating almost to the main land in the north-west angle of the Gulf of Mexico. Thus we have a loop, as it were, of this broad current of cold water, extending from Yucatan around by Texas to Florida. That there is a current of this character, close to Padre and Mustang Islands, is well attested by many persons familiar with that coast, and by the fact, that a few miles from the shore, at a depth of some twenty fathoms, a coral reef, usually bounding the Gulf Stream, separates the gradually deepening soundings in green waters from very deep soundings in that darkly blue water so characteristic of that stream.

The existence of this stream, in this western portion of the Gulf, conduces to many interesting effects. One is the "monsoon," to which special attention is desired, as it gives to this part of the coast of Texas that delicious summer climate, for which it is becoming so noted, being fanned by almost continued breezes, fresh and cool, directly from the deep blue stream, untainted by miasmatic influences, and hence as healthful as refreshing. As this wind is drawn towards the sandy plains in a direction N.N.W., a current of air is formed of a character unusually steady, embracing the Texan coast, and stretching far along the plains west of Arkansas and Missouri, through Texas, the Indian Territories, Kansas and Nebraska, carrying an equable temperature and rain-distilling clouds to a belt of country remarkable for its pleasantness and fertility, adjacent to sultriness and barrenness.

Another effect of this looped shape of this stream might be found in the accumulation of sea-weed and drift in its midst, as in the Atlantic, there called the "Sargasso sea." Two intelligent gentlemen, who have often traversed that part of the Gulf, have stated such to be the fact.

Another effect is found in the accumulation of tropical drift along the coast of Texas, partly from the Amazon and the Orinoco, brought by the stream and the monsoon. Such is found to be the fact, the coast from Brazos de Santiago to Matagorda being strewed with vegetable and animal debris, produced only in the torrid zone.

But, the most remarkable of all the effects of this stream is the gradual modification of the coast of Louisiana and Texas. An ingenious observation was made by Maj. Bowman, of the corps of engineers, that all the streams, entering the Atlantic and Gulf south of Cape Hatteras, have their mouths deflected from their general courses in a direction opposite to that of the Gulf Stream, thus showing, that there is a shore current counter to that stream; and this fact is fortified by the observation made by the writer, that the interior bays all along the coast, as far as the N.W. angle of the Gulf of Mexico, have their outlets to the sea at the ends of long sandy peninsulas pointing in the direction of this shore current. The existence of this counter current to the Gulf Stream is well established, also, by observation, and is availed of continually by navigators. Its average rate, from the mouth of the Mississippi to Matagorda pass, is about two miles per hour. In sweeping along the coast it carries with it to the west the vast volume of the Mississippi, with its drift and its silth, depositing the first along the shore of Louisiana, and carrying the latter, some of it, along the coast of Texas. The drift wood is driven by the southerly winds to the shore, and forms a gradual accretion, which has extended that portion of the coast west of the Mississippi full fifty miles further into the Gulf than that part east of that river. This accretion is composed chiefly of drift, a floating raft, sometimes covered with a mould, on which good crops are grown over a substratum, capable of being shaken for acres around by the weight of a man falling on it, and hence termed by the Creoles "Terre Tremblante." The silth is being gradually spread over the segment of the circle embraced between the coast lines of Louisiana and Texas around to Aransas Pass, and thence by the Gulf Stream to the Balize, the stream being the cord of the arc. Most of this silth is deposited near the mouth of the river, where it forms the "Ship Island Flats," some forty or fifty miles wide; and further west "Last Island" is found in the same accumulation. At Berwick's Bay the channel runs for twelve miles through silth so light, that a steamer often cuts through it one to two feet below the soundings. At Sabine Pass the bar is nine miles wide, and contains some sand. At Galveston the bar is seven miles wide, and is chiefly sand. At Matagorda the bar is three miles wide, and has little but sand. At Aransas Pass the bar is three-fourths of a mile wide, and is pure sand. And at Corpus Christi Inlet the plateau, which stretches around from the Balize, is wholly lost in Padre Island. It may be inferred from these facts, that the plateau, between the Gulf Stream and the coast west of the Balize, is being gradually silted up, and that in process of time the flourishing cities, now growing up along that coast, will be far inland, as New Orleans. South of Aransas Pass a like operation of deposite along the coast is observed in the accumulating sands poured out by the Rio Grande, which have within fifty years extended its mouth two miles into the sea, and have well nigh choked up the pass and harbor of Brazos de Santiago, where formerly there was deeper water than at any other part on the Texan coast.—From peculiar local causes, also, the pass at Corpus Christi Inlet has become obstructed by oyster reefs within the bay, whilst the bar is deeper.—The same causes, that operate to clear this bar, operate, also, at Aransas, whilst the harbor of Aransas is kept cleared out by favoring currents.

What causes prevent the accretion from forming along this part of the coast may elicit diversity of opinion; but the fact is certain; and thus has been gradually formed the sharp angle in the coast at this point. It is true, that this is about the axis of the current of the south east monsoon, before described; but, at first blush, that would appear to tend rather to pile up the drift on the shore and cause it to grow. It may be, that the current of the Gulf Stream runs so closely along the beach of Padre Island, that the counter current cannot pass between them, and that thus is produced a collision of currents, evolving convolutions and whirls, which stir up and dissipate the light sands, that alone form this part of the coast. Or it may be, that the waters become piled up in the angle of the shores, and escape by an under current, which carries off the sand with it. The bottom of the Gulf, all along this part of the coast, is indeed a hard, tough, blue clay, difficult to wash away; and there is no evidence of any appreciable change in its outline. At Aransas Pass there is a depth of eight feet on the bar, and at the distance of a mile on either side there is a depth of six fathoms, and on each side at four fathoms the blue clay is denuded, fine clean sand forming the bar between the harbor and the Gulf. So fine is this sand, that a slight current of water will move it; and it is believed that the currents produced by northers—the reverse winds of the monsoon—acting on the waters of the interior bays, may be so directed as to clear off this sand from the blue clay beneath, and thus give a permanent channel, with a depth of twenty-four feet, into the harbor. If this opinion, concurred in by scientific engineers and practical navigators, should prove true, this pass into Aransas Bay would open an important port at the north-west extremity of the Gulf of Mexico—an object of vast governmental importance, and of peculiar commercial significance.

A. M. LEA.

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Monsoon & Gulfstream
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